ABSTRACT

The disclosure relates to low-dielectric-constant nanocomposites which are synthesized by covalently tethering functionalized polyhedral oligomeric silsesquioxane (POSS) molecules to polyimide, wherein POSS containing nanopores are homogeneously distributed in polyimide; when POSS connects to ends or side chains of polyimide and forms self-assembled architecture, the distance between polyimide molecular chains is largely increased so that free volume is increased; and the polarization degree of POSS is lower than that of polyimide.